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**INDICATORS FOR INTEGRATED COASTAL ZONE MANAGEMENT (ICZM) : *Methodological Factsheets in support of comparable measurements and an integrated assessment in coastal zones***

The **ICZM Protocol for the Mediterranean Sea** (the 'ICZM Protocol'), signed in Madrid on 21 January 2008 and ratified on 24 March 2011, represents a milestone for the implementation of ICZM in the Region and can serve as a blueprint for the implementation of ICZM in other Regional Seas. The **PEGASO project** builds on existing capacities and develops common approaches to support integrated policies for the Mediterranean and Black Sea Basins in ways that are consistent with the ICZM Protocol.


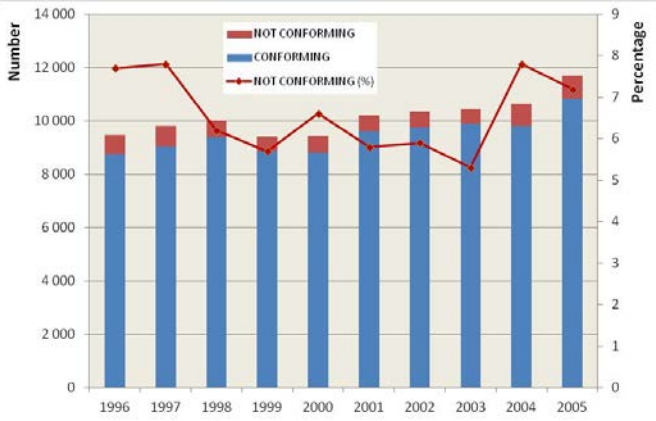
The PEGASO project has developed **a core set of indicators** that are instrumental in measuring the implementation of ICZM policies and programmes. The core set of ICZM indicators addresses the specific requirement of Article 27 of the protocol to '*define coastal management indicators*' and '*establish and maintain up-to-date assessments of the use and management of coastal zones*'. In doing so, the PEGASO project has widely built on previous and existing indicator sets developed by different institutions and projects, and which are duly acknowledged (see '[Methodological paper for the selection and application of PEGASO ICZM indicators](#)' for further reading and background material)

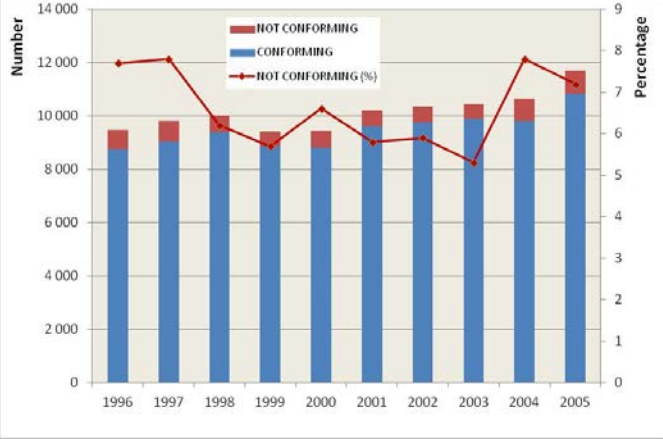
The present Methodological Factsheet is part of a set of 15 factsheets that are made available to end-users. This set of factsheets is conceived to support a harmonized approach to calculate ICZM indicators at different spatial scales in the Mediterranean and Black Sea regions.

Name of the Indicator	
Bathing water quality	
Objective of the indicator	
<p>The Bathing Water Directive (76/160/EEC) was designed to protect the public from accidental and chronic pollution incidents, which could cause illness from recreational water use. Examining the compliance with the directive therefore indicates the status of bathing water quality in terms of public health and also the effectiveness of the directive in ensuring safe bathing waters (<a href="#">EEA</a>).</p> <p>The Bathing Water Directive (BWD) is one of the oldest pieces of environmental legislation in Europe and data on compliance go back to the 1970s. Under the directive, Member States are required to designate coastal and inland bathing waters and to monitor the quality of the water throughout the bathing season (<a href="#">EEA</a>).</p> <p>New European legislation on bathing water was adopted in 2006. The ‘New Bathing Water Directive’ updates the measures of legislation and simplifies its management and surveillance methods. The classification of bathing water quality is determined on the basis of a three- or four-year trend instead of a single year’s result, which was the case for the previous Bathing Water Directive. Therefore, the procedure for assessing quality classes of bathing waters under the New Bathing Water Directive gives more reliable and realistic results (<a href="#">EEA</a>). The New Bathing Water Directive is based on scientific knowledge about the protection of health and the environment, as well as on environmental management experience (<a href="#">EEA</a>).</p> <p>The indicator describes the changes over time in the quality of designated bathing waters (inland and coastal) in the EU in terms of compliance with standards for parameters introduced by the EU Bathing Water Directive (76/160/EEC) and the New Bathing Water Directive (2006/7/EC): i.e. microbiological parameters (total coliforms and faecal coliforms) and physicochemical parameters (mineral oils, surface-active substances and phenols) according to the EU Bathing Water Directive (76/160/EEC) and microbiological parameters (intestinal enterococci and <i>Escherichia coli</i>) according to the New Bathing Water Directive (2006/7/EC). The indicator measures the proportion of designated bathing waters in an area that complies with the mandatory standard of quality specified by the EU legislation and the proportion that complies with the more stringent guide standard. The measurement should tell us about any change in quality that has occurred during the past twenty years or so to allow us to assess the effect of improvements in wastewater treatment plants on water quality.</p>	
Policy context	
ICZM Policy Objective	To perform Environmental Impact Assessment for human activities and infrastructures
ICZM Protocol Article	Article 9: <i>Economic activities (Article 9.2.d: Tourism, sporting and recreational activities)</i>
UNEP-MAP Ecological Objective	Objective 9: <i>Contaminants cause no significant impact on coastal and marine ecosystems and human health</i>
INSPIRE ANNEX I-III Data Theme (34)	Annex III

## CALCULATION OF THE INDICATOR

Spatial consideration	
Coverage	Resolution – Reporting unit
Mediterranean and Black Sea Regions: coastal designated bathing waters (excluding inland designated bathing waters and lakes)	Individual sampling points in designated bathing waters
Temporal consideration	
Period	Resolution (time interval or unit)
Since establishment of the BW Directive in 1976, and at least since the establishment of the New BWD in 2006	Annual data (see methodology)
Parameter(s)	
(i)	<p>Annual proportion of bathing waters classified in one of the 6 categories established by the methodology of the Bathing Water Directive.</p> <p>The parameters to be taken into account for assessment according to the assessment rules of the Directive 76/160/EEC are microbiological (1 Total coliforms, 2 Faecal coliforms) and physico-chemical (8 Mineral oils, 9 Surface-active substances reacting with methylene blue, 10 Phenols (phenol indices)). The results are classified and presented according to the following 6 categories on European, regional, national and local level:</p> <ul style="list-style-type: none"> <li>• CI: Compliant with mandatory values of the Directive for the five parameters;</li> <li>• CG: Compliant with mandatory and with more stringent guide values of the Directive for the five parameters;</li> <li>• NC: Not compliant with mandatory values of the Directive for the five parameters;</li> <li>• NF: Bathing waters that are not sufficiently sampled (frequency criteria not satisfied);</li> <li>• NS: Bathing waters that are not sampled due to external causes;</li> <li>• B: Banned or closed (temporarily or throughout the season).</li> </ul>

Calculation method	
Steps	Products
1 Record the number of sampling points in each category for the required level (local, sub-regional, regional, national)	<p>Number of sampling points (i) compliant with the guide value [blue]; (ii) compliant with the mandatory value [green]; (iii) banned [grey]; (iv) not complying with the mandatory value [red]; and (v) with inadequate sampling frequency [orange].</p> 
2 Divide the number of sampling points compliant with the guide value (blue) by the total number of sampling points (all colours) in each year and multiply the product by 100.	<p>Percentage of designated coastal bathing waters compliant with the guide value of the European Bathing Water Directive.</p>  <p>100% stacked column for each year showing the number of sampling points compliant with the guide values as a percentage of the total number of sampling points. A reference value such as the percentage of compliant sampling points for the wider region or the country as a whole should be included.</p>

3	Divide the number of sampling points compliant with the mandatory value (green and blue) by the total number of sampling points (all colours) in each year and multiply the product by 100 <sup>1</sup> .	Percentage of designated coastal bathing waters compliant with the mandatory value only, of the European Bathing Water Directive.
		 <p>100% stacked column for each year showing the number of sampling points compliant with the mandatory values as a percentage of the total number of sampling points. A reference value such as the percentage of compliant sampling points for the wider region or the country as a whole should be included.</p>
(4)	Data can be aggregated at sub-regional, regional, national and Mediterranean and Black Sea levels using the same formula as shown in Steps 2 and 3.	
Current monitoring		Data sources
EEA, through national reporting by the member states,		Data are freely available on <a href="http://www.eea.europa.eu/themes/water/status-and-monitoring/state-of-bathing-water/bathing-water-data-viewer">http://www.eea.europa.eu/themes/water/status-and-monitoring/state-of-bathing-water/bathing-water-data-viewer</a>
Assessment context		
Use of the indicator in previous assessments/initiatives	Mediterranean Strategy for Sustainable Development (MSSD) coastal indicators The changing faces of Europe's coastal areas- European Environment Agency EEA (2006) SAIL Schéma d'Aménagement Intégrée du Litoral (2006) DEDUCE Développement durable des Côtes Européennes (2007)	
DPSIR framework	State	
Link to anthropogenic pressure		
Sustainability target or threshold	All bathing waters to comply with mandatory values in Bathing Water Directive (76/160/EEC). All bathing waters are at least 'compliant' under the New Bathing Water Directive (2006/7/EC) and the number of bathing waters classified as 'excellent' or 'good' in the New Bathing Water Directive (2006/7/EC) increases.	

<sup>1</sup> Sampling points attaining the guide value must also have attained the mandatory value. Hence the number of sampling points compliant with the mandatory value in any particular year is the sum of all green and blue-coloured points.

Link with other assessment tools	
Example of integrated assessment	EEA assessment, UNEP-MAP plan Bleu : State of the environment and development in the Mediterranean 2009
<b>Scope for future improvements</b>	
<p><b>Methodology uncertainty:</b> There are differences in how countries have interpreted and implemented the directive leading to differences in the representativeness of bathing waters included in terms of recreational water use. These differences may refer to the number, density and location of the sampling stations, the frequency and timing of the sampling. It is important that this information, and any uncertainty in the results, derived from the sampling design, are duly reported and communicated.</p> <p><b>Data Harmonization:</b> In order to build a common, regional view for a particular indicator, it is crucial to harmonize the data in terms of e.g. concepts, definitions, reporting units, colour codes, value class boundaries and scoring methods. For this purpose, the PEGASO consortium has developed '<b>Guidelines for Data Harmonization</b>' which are available from the 'Products' section on the PEGASO project website <a href="http://www.pegasoproject.eu">www.pegasoproject.eu</a>. Although agreements may exist related to the presentation of certain indicators that are legally embedded, this may be less evident for indicators which are not (yet) used as an instrument within a policy context or within a region where the policy is not applicable. The PEGASO consortium encourages contributing partners, stakeholders and end-users to consult the 'Guidelines for Data Harmonization' document, and to actively engage in this process.</p>	
<b>Indicator references (i.e. UNEP, EEA, ...)</b>	
<p><b>Methodology references</b></p> <ul style="list-style-type: none"> <li>• <a href="#">Methodology for bathing water quality assessment in transition period</a> Globevnik, L., Zupan Vrenko, D., Kovačič, M. (2008) Methodology for bathing water quality assessment in transition period. Elaborate. European Environment Agency, European Topic Centre on Water.</li> </ul> <p>DEDUCE <a href="http://www.deduce.eu/SIF/SIF_16.1.pdf">http://www.deduce.eu/SIF/SIF_16.1.pdf</a> and <a href="http://www.deduce.eu/IFS/IFS16.pdf">http://www.deduce.eu/IFS/IFS16.pdf</a></p> <p>Spatial Data Infrastructure for ICZM in the South-East Baltic: <a href="http://corpi.ku.lt/SDI-4-SEB/state/16.pdf">http://corpi.ku.lt/SDI-4-SEB/state/16.pdf</a></p> <p>EEA : CSI-022 <a href="http://www.eea.europa.eu/themes/water/status-and-monitoring/state-of-bathing-water/bathing-water-data-viewer">http://www.eea.europa.eu/themes/water/status-and-monitoring/state-of-bathing-water/bathing-water-data-viewer</a> and <a href="http://www.eea.europa.eu/data-and-maps/indicators/bathing-water-quality/bathing-water-quality-assessment-published-3">http://www.eea.europa.eu/data-and-maps/indicators/bathing-water-quality/bathing-water-quality-assessment-published-3</a></p> <p>UNCSD : see <a href="#">bathing_water_quality.pdf</a> on <a href="http://www.un.org/esa/sustdev/natlinfo/indicators/methodology_sheets/oceans_seas_coasts">www.un.org/esa/sustdev/natlinfo/indicators/methodology_sheets/oceans_seas_coasts</a></p>	